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THE AESTHETICS AND PERCEPTION OF DOCUMENTARY FILM: A MIXED METHODS APPROACH AND ITS IMPLICATIONS FOR ARTISTIC RESEARCH

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Abstract

The ongoing research project *Gadgets, Phones and Drones* at the Zurich University of the Arts investigates how innovations in camera technology have affected the visual aesthetics of documentary films since the 1990s. With specially produced variants of short films, historical paradigm shifts are being subjected to contemporary comparative analyses. Major aspects of the aesthetic change, as for instance the tendency towards a shallow depth of field, are linked to the concept of authenticity or perceived realism.

The project's use of interdisciplinary research is oriented towards artistic research, or more precisely, towards a practice-based approach and is combined with empirical audience experiments. The dialogue between qualitative and quantitative research, also known as mixed methods, has enabled surprising new insights. However, the comparability of quantitative methods risks narrowing down the aesthetic potential of the filmic products that are used to conduct the research. In order to maintain a discriminating discourse within the practice-based approach, it is therefore advantageous to extend the study's framework beyond a quantitative and comparative research set-up and provide specific fields for artistic investigations.

Keywords: Documentary film, visual aesthetics, camera innovation, artistic research, mixed methods.

Introduction

The starting point of the research project *Gadgets, Phones and Drones* is the change in the visual aesthetics of documentary film since the 1990s in the context of digitalization. Innovations in camera technology repeatedly had a direct impact on image production and its aesthetics during this period.¹ This is particularly true in documentary film, where camera models from the consumer and semi-professional sectors are often used. However, the new alternatives associated with this change did not simply replace existing ones but established themselves parallel with existing options.

Until the early nineties, the heavy, professional shoulder camera for film or video remained predominant in documentary work. From 1995 on, small digital camcorders, recording the new DV format, came onto the market and were quickly adopted by professional filmmakers. The result was often a more spontaneous visual language similar to that of home video, with great depth of field (due to small image sensors) and increased dynamics in camera movement. In the late 2000s, DSLR (digital single lens reflex) cameras, which had previously only been used in photography, were now able to

record high-quality video. The shallow depth of field of the cameras (due to the large image sensors) led to a more abstract image aesthetic and thus to a re-establishment of the cinematic look in documentary film, comparable to the legendary 35mm cinema.

In the 2010's, a further paradigm shift can be observed in the simultaneous use of several cameras resulting in a multi-perspective concept in editing. For decades, documentary films had been largely shaped by the anthropomorphic gaze of a single camera. With the new tendency towards multiple camera perspectives, elements of a new visual style became evident. This development resulted from the increasing availability of high-quality but relatively inexpensive recording devices such as smartphones, actioncams and drones, which are often used in addition to the main camera of a documentary film production.

Evidently, the change to visual aesthetics caused by digitalization goes much further than these aspects and includes digital color grading, which became a major factor from the mid-2000s onwards. The progress of digital signal processing in terms of color reproduction, color depth and dynamic

PARADIGM SHIFT	When	Main features	Previous situation
Consumer Digital Video (DV)	Mid 90es	Large depth of field (small sensors) Small & lightweight cameras Low-cost equipment	Heavy shoulder cameras: 16mm film or Betacam SP High price / medium depth of field
DSLR cameras	2008 onwards	Shallow depth of field (large sensors) Medium to heavy weight (heavy lenses)	Large or medium depth of field ² / ₃ inch professional cameras or
		Medium priced	¹ / ₂ or ¹ / ₄ inch consumer cameras
Multiple perspectives	2015 onwards	Multiple cameras used simultaneously Mostly technomorphic gaze	Single camera view Anthropomorphic gaze

Table 1 Postulated paradigm shifts and their effects

¹ One can argue that the change actually started with the introduction of Sony's analog consumer format Hi8 in the late 1980s. The format anticipated some of the characteristics of the later digital DV standard. It introduced a relatively high image and sound quality, as well as small, handy camera models. The widespread breakthrough in the market, however, only occurred with the introduction of DV.

range had an accelerating effect. For reasons of comparability, however, this paper focuses exclusively on the aforementioned paradigm shifts regarding sensor size (and the associated depth of field), as well as on the tendency towards multiple camera perspectives (and the associated abandonment of the anthropomorphic gaze) in documentary film. As the research project is ongoing, this paper puts emphasis on the tendency towards large image sensors and thus towards a more abstract visual style based on shallow depth of field.

The project's central research question addresses the effect aesthetic changes have on the concept of authenticity or perceived realism: Do new aesthetic approaches, which are induced by camera innovations, lead to a different perception of reality in connection with documentary content?

Research Approach

Whereas this project applies an interdisciplinary approach and integrates relevant literature from film and media studies, it is centered around artistic research with a practice-based focus². Significant aesthetic changes associated with the digital turn are re-explored by producing short documentary films. The exemplary comparisons serve as a basis for artistic examinations and are discussed in focus groups consisting of filmmakers and the research team. This qualitative approach is combined with quantitative empirical research where a broad audience watches the produced short films in a cinema experiment and fills out questionnaires. The results of the audience experiments are fed back to the artistic discussions in the focus groups.

Before aesthetic changes were examined in practice, a review of theory and film history was conducted as an important step in establishing a theoretical background. In addition, gaps in the theoretical field were compensated for with selected expert interviews in order to get a more complete and practice-orientated overview of the aesthetic changes that can be observed.

In a deviation from the original research plan, additional filmic examinations were introduced after an evaluation of the preliminary results and feedback from the filmmaker community. It had become evident that the strict framework of comparability tended to restrain artistic creativity and narrative coherence in the filmmaking process. As a consequence, further iteration cycles were introduced to examine the potential of the aesthetic shift caused by changes in camera technology. With regard to our use of terminology, these additional iteration cycles could be associated with a practice-led rather than with the practice-based approach that is otherwise dominant in this project, as a focus on creativity could lead to a new understanding of practice. In the context of the paradigm shift in the size of sensors, smaller cameras with a large depth of field invite the camerapersons to take risks and use the camera in ways not possible with bulkier camera models and a shallow depth of field. The creative exploration of new technical possibilities thus leads to new forms of practice. Similarly, the availability of low cost, versatile camera models such as actioncams, drones and phones can lead to new editing concepts and narrative strategies, which again implies new forms of practice³. The importance of the practical perspective in this project is also reflected in the composition of the research team. Apart from the principle investigator who is a filmmaker and faculty member of the Zurich University of the Arts, the core team consists of a documentary film director, a cameraperson, a film editor and a media psychologist.

² According to The Vienna Declaration on Artistic Research (ELIA, 2020), artistic research is understood as the general term with the subcategories practice-based and practice-led research. (Cf. also Borgdorff, 2012; Candy & Edmonds, 2018; Skains, 2018).

³ For the differentiation of the terms practice-based and practice-led see Candy and Edmonds (2018) or Skains (2018).

Theory and Film History

The postulated topic and the central research question are first reviewed against available theoretical and historical publications in the field of film and media studies, exposing new aspects of the topic and gaps in the existing research.

The changing visual aesthetics in documentary film of the last 25 years has so far only partly been dealt with in film and media studies. While there is plenty of literature available on the advent of digital video (DV) cameras and the associated trend towards home movie aesthetics, the later change to large sensor cameras and the recent emergence of multiple camera perspectives have hardly been described so far, and if so, then only in individual reviews of films. In general overviews of documentary film history, the focus of the last 25 years has been on other topics, primarily an increasing emphasis on the narrative, the performative, subjectivation, the dissolution of the boundaries between feature and documentary film and digital media convergence (Bordwell & Thompson, 2003; Bruzzi, 2006; Nichols, 2010; Niney, 2012). If the shift to digital video is taken up, it is primarily focused on the democratization of the means of production and the resulting increase in production volume, and only secondarily on the widespread emergence of the home movie aesthetic in connection with the market launch of DV (cf. Ellis & McLane, 2005). Ellis (2012) ascribes to documentary filmmakers a propensity for technical innovation in order to pragmatically improve their shooting situations: "Documentary filmmakers are, in the main, technological opportunists" (Ellis, 2012, p. 34). With regard to DV cameras, Ellis points out that the camera can be guided without the need to have the eye on the viewfinder, thus emphasizing the lower entry threshold into communication between the filmmakers and the people being filmed (Ellis, 2012).

In publications that specifically focus on the changes of the 1990s, a more in-depth examination of the new image aesthetics of DV and small cameras can be observed. For

instance, Müller (2011) published an extensive work on this topic in *Grosse Bilder mit kleinen Kameras* (big pictures with small cameras), in which he explicitly deals with the entry of DV camcorders and their aesthetics in German-language documentary film. In his view, it only makes sense to speak of "DV aesthetics" if "directors consciously use the visual quality of digital consumer technology to create an idiosyncratic visual language; if the 'disturbing aesthetics' of DV images adequately visualize the film content; if the extreme mobility and lightness of the handheld camera leads to a seemingly unprofessional image design that expresses a high degree of authenticity." (Müller, 2011, p. 281). The availability of the new and inexpensive DV technology played a major role especially in countries where filmmakers in political opposition produced their films in order to show their works at Western festivals (Ellis & McLane, 2005). Several authors describe this phenomenon in more detail (e.g. Zhang, 2004; Wang, 2005; Bulgakova & Mauer, 2016).

The trend towards increasing stylization by digital photo cameras with large sensors, which began in 2008, can hardly be described as a uniform phenomenon. In contrast to the evident new aesthetics of DV cameras, this is a re-establishment of an already existing visual style, which has always been known in relation to the shallow depth of field – namely as a characteristic of 35mm film. However, due to the affordability of the new digital models, this phenomenon was tantamount to an extensive democratization of the cinematic look, which had previously been reserved for expensive productions. The novelty of the phenomenon is therefore mostly treated in publications in the context of 'cinematic style' or 'cinema look'.

The debate about the pair of opposites 'film look' vs. 'video look' has been conducted on an aesthetic level since the beginning of the 1990s, when electronic image-recording made great qualitative progress and were increasingly traded as alternatives to the conventional analog film recording (Flückiger, 2003; Hahne, 2005; Roberts, 2002; Slansky, 2004). Since

for technical reasons digital cameras were still equipped with smaller image sensors through until the late 2000s (2/3-inch chips for professional models, 1/2 to 1/4-inch for amateur cameras), the depth of field resulting from the image sensor was an important factor in the discussions. Other factors were the range of contrast and color range that the recording methods were able to cope with (Bordwell, 2003; Flückiger, 2003; Slansky, 2004). These aspects are still being discussed today in the context of 'film look', while the depth of field associated with sensor size quickly lost importance, as sensor size was no longer the primary differentiating factor between analog film recording in cinema format and digital recording with new camera models starting around 2008. Apart from the discussion about the 'film look', however, there are hardly any recent publications that deal with the aesthetic consequences of camera models with different sensor sizes.

The change to an increasing multiple camera perspective is also being investigated in very few studies, as the phenomenon is still young. So far, only critical analyses of individual films have been published. In ethnography, for example, the film *Leviathan* (Castaing-Taylor & Paravel, 2012) is an example of this discussion. This film makes exemplary use of multiple camera perspectives that are decidedly different from a human, anthropomorphic view. Several articles in the *Visual Anthropology Review* have dealt with this new visual style, and it is widely believed that *Leviathan* is an exciting kind of visual and sensitive cinematic ethnology, sometimes related to the way new technologies are used. The phenomenological term "immersion" (Landesman, 2015, p. 14) is also often used for this sensory audience experience. Nichols (2016) attributed "an eerie, mysterious quality" to the effect of the multi-camera perspective in *Leviathan*, "in which the human figure, let alone any distinct individual, is difficult to recognize" (p. xvi). Fallon (2016) places both *Leviathan* and *The Cove* (Stevens, DuPre Pesmen, Clark, & Psihoyos, 2009), in which hidden multiple cameras are used, in a tradition of films in which the boundaries of cinematic aesthetics are extended by the

latest technology. In the case of *The Cove*, these included "night vision cameras, thermal imaging, or multiple GoPros in order to deliver rich, multi-sensory experiences to viewers" (Fallon, 2016, p. 125). Plantinga (2013) sees the multiple use of hidden and technomorphic cameras as an attempt to create objectivity in a film that is otherwise characterized by subjectivity.

The distinction between anthropomorphic and technomorphic cameras has a longer tradition in film studies, especially in relation to feature films (cf. inter alia Sobchack, 1991/2004; Brinckmann, 1997; Branigan, 2006; Flückiger, 2016). The stylistic device of the anthropomorphic hand camera is often referred to in film studies, whereby the authenticating effect or the connection to a realistic style is also in the foreground. Beyerle (1997) ascribes to the searching gaze of long-lasting handheld camera shots in uncontrolled situations of direct cinema the effect of awakening the audience's "joy of discovery", thus linking anthropomorphic handheld camera with the film historical discourse of deep-focus cinematography of the 1940s and 1950s (Bazin, 1975; Bordwell, 1997; Prince, 2004). The great depth of field of the direct-cinema pioneers was given by the small image windows of the 16mm cameras and therefore comes – similar to the visual strategy of Jean Renoir, for example - very close to the human way of seeing, which does not know a flat distribution of focus. Carrol (1996) thus explicitly points out the connection between the handheld camera of direct cinema and "deep-focus realism," which enables viewers to see autonomously. The different aesthetic effects of camera sensors (large depth of field for small sensors, small depth of field for large sensors) should also be seen in the context of this discourse. The incidental details described by Beyerle (1997), which create an authenticating effect, can effectively disappear simply by choosing a camera model (and the associated shallower depth of field), thus forcing a link between sensor size and authenticating effect. Wortmann (2006) also points out that the "indexical surplus of possible meanings" is often taken as an occasion to "read the semiotic added value of

a photograph as an authenticity value" (p. 180), yet he does not see the authentic effect as a technical fact, but rather as dependent on "what the viewer of an image invests in the possibilities of meaning in the authentic image". Thus, authenticity in the image media (...) cannot be defined in terms of media ontology, but rather as "the effect of a cultural pattern of action that is not necessarily bound to technicality" (Wortmann, 2006, p. 183).

When choosing stylistic devices, documentary filmmakers do indeed always ask themselves the question of their effect on an audience. Inevitably connected with this is the question of authenticity, in the sense of the closeness to reality, the credibility, truthfulness or genuineness of a certain form of cinematic representation (for a definition of authenticity, see Kalisch, 2000; Knaller/Müller, 2006, and in relation to the documentary film: Hattendorf, 1999). While authenticity as a concept has continuously retained an important status in the debate among practitioners in the filmic environment, it has remained controversial in the humanities debate and seemed increasingly inappropriate in postmodern discourse (cf. Graulund, 2010; Huyssen, 2006; Knaller/Müller, 2006). In such debates it is no longer authenticity per se that is assumed, but rather terms such as authenticity effects, authenticity longings, authenticity fictions or authentication strategies that produce the authentic in the first place (Daur, 2013). A closely connected concept in media and audience research is perceived realism (cf. Hall, 2003). According to Hall (2003), various subcomponents constitute this multi-dimensional construct like factuality, plausibility, typicality, perceptual persuasiveness, narrative consistency and involvement. Pouliot and Cowen (2007) point out that factuality is more important for documentary than for fiction, because the spectator activates a process similar to reality testing by comparing the data in the film with his or her knowledge and beliefs about how real events happen. Similarly, and with reference to documentary film, Hattendorf proposes a concept that understands authenticity as the code of a mediated reality – directly dependent upon the visual style. But such a code

can also be produced, for example, in feature films or mockumentaries (Hattendorf, 1999; Hohenberger, 1998; Huck, 2012; Kreimeier, 1997; Landesman, 2015; Odin, 1998). The strategies of authentication of a chosen cinematic form or a certain documentary method are thus among the basic considerations in the creative decision-making process (Iseli, 2009; Dux, Iseli, & Vitija, 2020) and were given appropriate weight in the conception of the comparative studies.

Consulting theoretical and film historical publications in film and media studies resulted largely in a confirmation of the described phenomena and emphases in most areas of the thematic focus of the project. In those areas where the described developments are still relatively new, or where the research angle is very specific, gaps in coverage were found in particular. However, for the design of the comparative studies, the review in the field of film and media studies still provides important impulses, especially regarding the connection of deep focus photography and authentication strategies.

Expert Interviews

Since there are only a few studies with a specifically practice-related focus (especially Müller, 2011; Eriksson, 2012), an extended reviewing process was dedicated to the perspective of practitioners, based on interviews with selected experts. The primary goal of the interviews was to historically reappraise the influence of the development of camera technology on documentary films from the filmmakers' perspective and thus to refine the questions for the experiments. The focus was on filmmakers, camerapersons and festival directors who have either observed the change in their professional life or have played a significant role in shaping it. The method of systematizing interviews with experts stems from qualitative research in the social sciences (cf. Bogner, Littig, Menz, 2009). It not only helps to compensate for the lack of existing literature and studies but serves as an up to date, practice-oriented review of the issues.

The questions revolved around the two core issues of what camera technology filmmakers use and why, and whether they have similar views on aesthetics and authenticity as film and media theorists. Ten semi-structured interviews were conducted with mostly *Swiss* documentary filmmakers whose work has received international recognition: The directors Jean-Stéphane Bron, Thomas Imbach and Samir; the camerapersons Séverine Barde, Patrick Lindenmaier, Pierre Mennel, Sophie Maintigneux and Eric Stitzel; and the festival directors Ally Derks, IDFA (active from 1988-2017) and Daniel Sponcel, the current director of Dok.Fest Munich. The interviews lasted between 1.5 and 2.5 hours. They were transcribed, encoded and evaluated.

The following findings are relevant to the first experimental set-up, which deals with the difference between palmcoders and large shoulder camera, including the difference in sensor size and the resulting depth of field. The interviewees all agree in naming the fundamental change and its primary consequences: The DV cameras that came on the market in the mid-90s – as well as the camcorders of the analog Hi-8 format a few years earlier – were the first to provide sufficient image quality to be used in professional film. Their main advantages were that, unlike 16mm film they could record for an almost unlimited amount of time (with 16mm film one roll was enough for approx. 10min). They were also comparatively very cheap, much smaller, handier and easier to use. All these aspects led to the fact that DV cameras became especially popular in independent productions and caused a democratization in the field of documentary filmmaking. The interviewees confirmed that many productions would probably not have been made without the low-priced DV cameras. The financially and technically lower entry threshold for filming led to more amateurs or non-professionals making films. Also, many directors started to shoot themselves without a cameraperson, which usually led to more intimate films, but also to lower standards in image aesthetics. Ally Derks, the founder and director of the Amsterdam International Documentary Film Festival (IDFA)

recalls that it was suddenly “possible to make movies in a cheaper way. The editing was much cheaper, the shooting was much cheaper, the lighting was much cheaper. I’m not talking about the technical quality, but the video also made it possible – the handheld camera-made it possible to come very, very close to the subjects of your film. And that was really a big innovation [...] everybody could make a film, you didn’t need expensive equipment anymore” (Derks, 2018).

While there is general agreement on the democratization effect, there are different attitudes regarding the adaptation of the new technology in one’s own work. Some of the professionals were, and still are, rather skeptical about consumer technology. *French* camerawoman Sophie Maintigneux concludes: “... I can’t do that. I come from this generation, I’m sorry, where I have to have the camera on my shoulder, I have to have my eyes really on the eyepiece, I have to have this connection, physically, this connection between the camera and me. [...] That means, I have never used these little cameras, never. And I won’t ever do it” (Maintigneux, 2018). For others, the new consumer technology was the door to a new world. *Swiss* director Thomas Imbach, who released the two style-defining documentaries *Well Done* (1994) and *Ghetto* (1997), speaks of a “liberating blow” [...] “a big step in the direction of dynamization, that you could really stay close to the people [...]” He remembers that he was looking “for representations that actually went beyond this visual realism or this, yes, this naturalism, and I looked for a new world of images, [...] a world of images that takes place in the realm of macro distances” (Imbach, 2018).

The so-called ‘home movie style’ proved to be a term the interviewees hardly applied to their own work. For the most part, the camerapersons saw the emergence of DV as a low-cost alternative, with which they felt able to pursue comparable aesthetic aspirations, just as they had when using conventional equipment. Cameraman and postproduction specialist Patrick Lindenmaier refers to the explicit home movie style

as follows: "People have used it in commercials and other things, but I think in documentaries that wasn't an important tendency [...] it wasn't intended, it was just a fact that the way the images were shot, how the images were composed, how they were panned, and all that just wasn't very professional" (Lindenmaier, 2018). Also, the image quality of the DV cameras seemed not to be appreciated as an aesthetic on its own but was simply considered as of sufficient quality. Festival director and former documentary filmmaker Daniel Sponcel has argued that: "[it was] not an [aesthetic] that anybody ever wanted, nor one for which somebody would still stand up now and say: that was a great aesthetic, worth keeping" (Sponcel, 2018). Thomas Imbach sees the introduction of small cameras in the nineties as the beginning of a development "where the camera becomes more and more volatile and actually becomes a gadget that can be used in various ways and no longer in the sense of a classic camera" (Imbach, 2018).

In today's documentary filmmaking, digital cameras with super 35mm sensor size and good dynamic range have become standard. Because these cameras deliver a more cinematic image with a shallower depth of field, they have again become more demanding to handle. Today, fewer films are made by amateurs/directors alone and therefore the image aesthetics have increased again. Many of the cameras that are used for feature film productions today are also used for documentary films. Indeed, Sponcel points out that "in the late 90s [and] well into the 2000s, you went to the cinema and didn't need to know anything about the film. As soon as the film started, it was immediately clear whether it was a documentary or a feature film, because one was shot on 35mm and had a top-notch postproduction and the other was, in the worst case, shot on miniDV and then transferred to film. That means you saw it immediately. And today you do not see it any longer" (Sponcel, 2018).

For the second paradigm shift, which focuses on the multi-perspective and the possibilities of gadget cameras

(drones, action cameras, such as GoPros, and smart phones) the inputs of the interviewees were helpful for gaining an overview and for the classification of the different tools in terms of narrative viewpoints. All of these devices have been used by the interviewees, but with various popularity. Drones are well established and most filmmakers use them, albeit cautiously for fear of overuse. They mainly employ them in moments when they might benefit the narration. GoPro cameras are the market leader for action-cams and are one of the most popular cameras seen on YouTube. Small, cheap, easy to use and almost indestructible, they now dominate sports filmmaking. Since they are very easy to mount on people or vehicles it is a quick way to record spectacular images. However, most of the documentary filmmakers interviewed here are careful in their use of GoPros because the visual aesthetic doesn't usually fit well into the overall camera concept of their movies. Also, for director Jean-Stéphane Bron, GoPro Cameras are mainly used to provide corroboration. "You want to prove that you are there [...] I think that is the main goal of the GoPro. I was on the mountain, I was flying [...] I was a policeman, I was arresting this guy. [...] But I haven't seen a good movie with a GoPro so far, maybe one" (Bron, 2018).

Another rather obvious reason that not more films are shot with GoPros is the lack of visual control over the picture. It has a wide-angle lens with a fixed focal length. Cameraman Pierre Mennel comes to an explicit conclusion: "I can't play with space, I can't play with depth of field, I can't use all the things that are inherent to a cinematic image" (Mennel, 2018). Smart phones have the same visual limitations. None of the cinematographers or directors interviewed has shot a documentary solely on a smart phone. Furthermore, the quality of the picture hasn't been comparable to video or cinema cameras so far. But that doesn't mean that smart phones aren't used in documentary film. Very often footage from smart phones is used, for example when a protagonist films himself, or if it is a film that works with "found" footage from non-filmmakers who filmed an event or a scene. But the multi-perspective derived

from shooting with different points of view also opens up opportunities for new audience experiences in documentary filmmaking. Swiss Director Samir concludes: "I find that interesting, because people are running around with GoPro cameras, others are taking a snapshot with their mobile phones, there is a drone flight [...] And all these things are put together to form a new reality, which is actually an exaggeration of reality that we cannot experience as individuals" (Samir, 2018).

The expert interviews led to a rich variety of views on the paradigm shifts in documentary film. The research team's emphasizing of the historical processes as well as the appraisal of the impact of the technical innovations were largely shared by the interviewees (Dux, Iseli & Vitija, 2020). An interesting deviation occurred with regard to the emphasis placed on the so-called 'home movie style', which the majority of the interviewees rated as less important than did the research team. Consequently, they weighed the process of democratization through the low costs of the format higher than the creation of a unique DV style. Regarding the authentication effects of large depth of fields, lower image quality and amateurish camera handling, there was a general understanding that these parameters are likely to establish a more intense reality sensation and credibility. However, the interviewees tended to have a more complex and at times also diverging view on authenticity. They often linked it to the style or attitude of the filmmakers, rather than to technical parameters.

Mixed Methods

The research design of *Gadgets, Phones and Drones* relies in part on the combination of qualitative and quantitative methods. The qualitative artistic research approach is completed by quantitative empirical surveys following methods derived from media psychology. In audience experiments the subjective feelings of test persons are measured with the help of questionnaires. The film variants serve as stimuli for measuring possible effects in terms of image aesthetics, presence

and the sensation of reality. The results of the audience experiments are then fed back to the workshops and focus groups run by the research team, supplementing the discourse of experts with the subjective perception of laypersons. The workshops and the focus groups represent the core elements of the qualitative research approach. Participants in the focus groups are the research team, research partners and other experts from the filmmaking community (peers).

The combination of qualitative and quantitative methods goes back to a tradition under the term "mixed methods" (see Clark & Creswell, 2011). The sequence outlined above, and displayed in Fig.1, corresponds to an explorative, sequential design. Similarly, Chilton and Leary (2014) describe this process as a transdisciplinary approach that combines theoretical knowledge with artistic and practice-based expertise in reciprocal, process-oriented research cycles. The quantitative surveys complete the evaluation of the qualitative investigations. As milestones in the course of the project, the focus groups serve to discuss and reflect on the qualitative and quantitative results and enable a practice-oriented contextualization.

In the main part of the research project, the paradigm shifts are addressed in practical comparative studies that cover two main aspects of aesthetic change. With these practice-based experiments, historical changes in documentary film are transferred to the present and are analyzed in a narrowly defined and systematic framework. In the first study, which is discussed in detail in this paper, a short documentary film is shot with the help of two camera teams acting simultaneously in such a way that a variant with the conventional configuration (e.g. large depth of field due to small recording chips) and a variant with the modified configuration (e.g. shallow depth of field due to the use of large sensors) are created. This allows a systematic comparison of the resulting image aesthetics. In addition, the results directly reconnect to the findings of the precedent reviewing and interviewing phases of the project.

MIXED METHODS

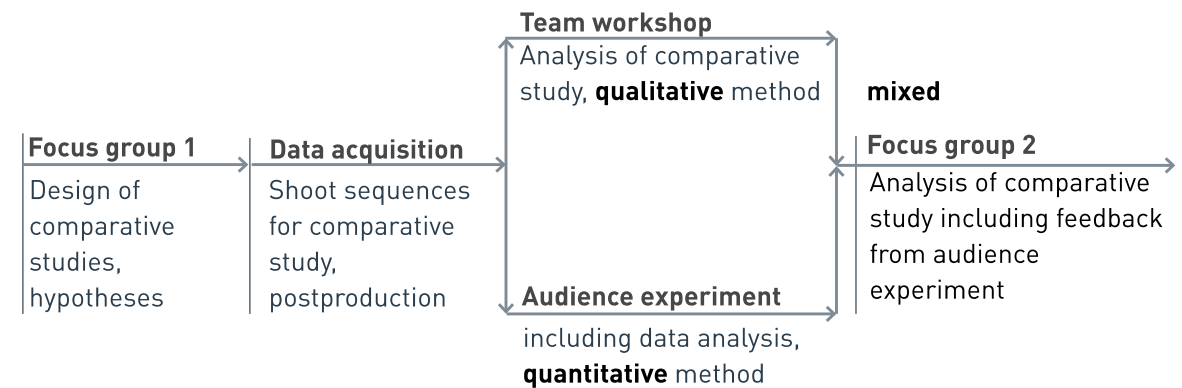


Fig. 1 A simple research sequence with the combination of qualitative and quantitative approaches, usually referred to as "mixed methods".

The comparative film variants are analyzed, on the one hand, by focus groups, consisting of the research team and peer experts. In a qualitative approach they discuss the resulting variants with regard to the previously formulated hypotheses and the findings of the reviewing process and the expert interviews. On the other hand, the film variants are used to conduct audience experiments by means of questionnaires. The test persons are not aware of the purpose of the research nor of the context for the questionnaires. The findings are used as challenging feedback for the discussion and analysis of the focus groups. The inclusion of the audience perspective as a corrective measure is based on the idea that filmmakers always consider the effect on hypothetical audience when making decisions. In this sense, the Mixed Methods approach can be seen as the equivalent of intuitive artistic decision-making.

A central element in the sequence of artistic research is the documentation of relevant research processes. On the one hand, this is done with the help of a logbook in which important steps are written down by members of the research team. At the same time, important decision-making processes and complex situations are recorded on video and are thus

available for analysis. The data collection is to be understood as a multi-layered process, since both the produced material (edited film variants as well as the raw material of the shooting) and the meta-level (i.e. the recording of the reflection of the production work and the production-aesthetic discussion) are used as primary data for the analysis and are subsequently made available in accordance with an open access policy. In addition, the video archive serves as a source for the publishing of video essays to complement the traditional written output.

Practice-based Comparisons

The principal part of the research project is to study the influence of camera innovations on visual aesthetics, perceived authenticity and the work of documentary filmmakers (e.g. camera handling or editing). For this purpose, two comparative studies were designed: one on the difference between video palmrecorders and digital film cameras (i.e. small sensor vs. large sensor) and the other on the comparison between multi-camera perspectives vs. single camera perspective. In order to provide a comprehensive view on visual style and authentic perception, it was important that the comparisons

did not relate to individual images or sequences, but to a broader cinematic experience in a narrative context. Therefore, complete films were produced, combining different documentary approaches such as observing camera (a.k.a. direct cinema) and interview situations. External filmmakers who advised the project within the focus groups strongly advocated that the experimental set-up should go beyond the purely technical and include a content driven shooting task.

For the first practical comparative study, it was expected that the small chip cameras (palmcorders) would allow for more flexible and spontaneous shooting and result in an image aesthetics reminiscent of home video or news gathering. Thus, the footage of palmcorders seemed more likely to have a greater authenticating effect than the images recorded with large sensor cameras and a shallow depth of field (cf. table 2).



Fig. 2 Excerpts from the first comparative study about the dance rehearsals. Above left: Panasonic Palmcorder, right: Sony shoulder camera. Below left: Sony shoulder camera, right: Panasonic Palmcorder

Hypotheses	
Image Sharpness / Image Aesthetics	<ul style="list-style-type: none"> - Images of the large sensor camera are judged to be sharper than images of the small sensor camera. - Images with a larger dynamic range (large sensor camera) are perceived as more aesthetic.
Authenticity / Credibility	<ul style="list-style-type: none"> - Images with high depth of field (small sensor camera) achieve higher levels of credibility in the judgement of the viewers. - Images with a smaller dynamic range (small sensor camera) are perceived as more authentic.

Table 2: Hypotheses regarding small sensor cameras vs. large sensor cameras

For the audience experiments, led by a media psychologist, the comparability of the film variants had a high priority. This meant that the films needed not only to have the same narrative content, but to also contain the same scenes with the same number of identical protagonists, preferably of equal length and with a matching editing rhythm. This raised a number of practical questions as to how this could best be achieved. Since perceived authenticity and perception of reality were important concepts for the study, it was out of the question to stage certain actions in order to film them in a documentary way afterwards. The answer was rather to choose situations that have a repetitive character of their own in order to get the same or similar situations as often as possible.⁴

The film variants of the first study were shot at dance rehearsals of the bachelor's program in Contemporary Dance at the Zurich University of the Arts. The repetitive character of the rehearsals with the identical cast of students and teachers seemed to be ideal. The goal was to compare the image effect on the viewers and how they perceived the difference between an image with a small depth of field and poorer image quality compared to a large depth of field with a more cinematic look. For this purpose, two camera operators were filming simultaneously with a small Panasonic HDC-TM900 palmcorder equipped with a 1/3-inch sensor and a Sony FS 7 shoulder camera with a large 35mm sensor. They focused on producing the same content with the same framing. This could be best achieved, when one cameraman took the lead and the other tried to follow his moves, following some sort of a master/slave-principle. The shoulder camera was the main camera and the palmcorder copied the framing. The two cameramen stood as close as possible to each other. In preceding workshops of the focus group, this shooting procedure had been discussed in detail and it eventually proved to be effective. In terms of content, it was decided to focus on three protagonists within this dance class: two students

and a choreographer. The interviews with them form the narration, which is complemented by the observational footage.

Apart from the obvious difference regarding the depth of field, the peer experts also pointed out that the handling of the cameras was completely different. Because of its light weight and size, the palmcorder can easily be operated with a single hand, which allows for more spontaneous movements. For instance, a camera operator can easily pull down in one movement from above his head down to his feet. The heavy Sony F7 camera, however, needs to be carried on the shoulder and is thus much more restricted in its movements. The peer experts therefore argued that the comparative study should include different film styles based on the way the camera can be guided. As a consequence, the intuitive artistic choice of playing with the ergonomic properties of two different tools was included as a variant. These takes were shot separately and not simultaneously so that the cameramen did not get in the way of each other and were free to move around. However, taking into account artistic decisions like this means that the individual shots are likely to differ greatly, potentially exhibiting completely different content and with differing lengths and rhythms.

During editing, it quickly became clear that it was indeed impossible to accommodate the requirements of both the quantitative and the qualitative method in one film. For the audience experiment, comparability was lost as soon as a sequence didn't show exactly the same content. Thus, for the main audience experiment, the film variants only contained the comparable shots of the simultaneous master/slave recording. The two variants were both 9 minutes long, one of which contained the shots made with the large sensor camera (Sony FS7) and the other the shots made with the small sensor camera (Panasonic Palmcorder). In addition, selected shots made with both cameras were edited consecutively for a direct comparison. Here, the visual differences were more

4 Minutes of focus group 1, Zurich University of the Arts, 2018.

clearly visible to the audience. This allowed a more precise questioning with regard to the aesthetics. The test was also designed with the concept of so called 'forced choices', which inherently leads to clearer results.

The artistic variants were discussed in the focus group as a part of the qualitative research approach. The differences between the variants were substantial, since camera size influenced the chosen style to a large degree. The palmcorder variant was a lot more dynamic with shots that were filmed close to the dancers, while the material captured with the Sony F7 seemed a lot more cautiously filmed, as it was obviously very difficult to keep the shots in focus due to the extreme shallow depth of field at close distance. In the end, the comparison of these additional variants was very meaningful because it referred both to the style and to the process of making; not just to the technical characteristics of the sensor size. This comparison shows what Jürgen Müller (2011) meant by an independent DV-style and correlates both to what has been discussed by other theorists and described by the experts in the interviews. Nevertheless, the comparison of the two variants gave rise to intensive discussions. In the workshop with the focus group, the film variants were viewed critically by some filmmakers because, once again, they were very difficult to compare due to the number of differing components. Consequently, the discussion shifted to a consideration of process; how the small chip camera influences the chosen style and what stylistic output from such cameras might be appropriate. The discussion was less concerned with comparability or the final products. Focusing on the process, it would have been interesting to have detailed reports from the camerapersons and editors about their specific creative choices, rather than just the final results.

The discussions showed that artistic research addresses a much more complex conglomeration of questions than when comparability alone provides the framework. Therefore, when artistic processes are involved, the planning will be more time

consuming as the combination of methods results in a genuinely multi-faceted product. Artistic process demands its own specific field of investigation to account for the diversity of results.

In the second and still ongoing comparative study, the dilemma of executing a solid comparative concept versus the tendency to seek an artistic interpretation stood out even more. Here, a dog school serves as the setting for the film variants. The comparison focuses on the difference between an anthropomorphic single camera view versus the multiple perspective of several cameras. The non-anthropomorphic angles are introduced with the dogs' perspective by placing GoPro cameras on their shoulders. Also, drones were used to gain a bird's eye overview of the scene. On top of this, a protagonist used a smart phone to record his particular view of the action.

In order to arrive at comparable shots with identical content, both variants needed to be shot simultaneously, which made shooting and editing much more difficult. GoPros, as well as smart phones, have wide-angle lenses and therefore record a lot of space. As a result, the crew operating the main shoulder camera was often in the frame. For the audience experiment, however, both versions had to be without the camera crew, otherwise comparability could not be guaranteed. As a result, many scenes could not be used, and it became a great challenge to still arrive at a narrative concept.

Two film variants of 11 minutes length were made for a second audience experiment, examining spatial and narrative orientation, aesthetics and credibility.

Even though the findings of the second study are still pending and the related focus group discussion has not yet taken place, an extraordinary peer screening with camerapersons, editors and journalists from the Swiss national broadcaster SRF, revealed certain weaknesses in the film variants.

It was primarily the multi-perspective variant that editors criticized. They missed a differentiated narrative style for the multi-perspective and argued that the editing of certain scenes should concentrate more on a sequential editing of the camera perspective with less changing between the different camera viewpoints. They also understood that if it had been conceived from the beginning as an independent multi-perspective work, it would certainly have been shot and edited differently. So again, the requirements of comparability for the empirical experiment stood in the way of an artistic examination. Or a second iteration cycle could help to adjust the shooting. The broadcasting professionals concluded that a multi-perspective camera setup, as it is often practiced in television, does not bring any added value without narrative anchoring. In fact, without such anchoring it could lead to confusion and disorientation.⁵

The test screening with the broadcast professionals was very helpful for the research team. It led to the conclusion that for a fruitful and differentiated discussion in the context of artistic research it is necessary to produce additional variants that are completely led by artistic intention. The production of these variants has been delayed by the Covid-19 pandemic and will be implemented soon.

Results and Discussion

The sensor size related experiment was successfully conducted in a cinema. 86 participants (56 female, 28 male, 2 no information; age between 16 and 86 years with an average of 32 years) saw both short films and small clips for a direct comparison at the end. They filled out a questionnaire on a laptop after each film. In the direct comparison, the images of the large sensor camera (Sony FS7) were found to appear sharper and more aesthetic (cf. figure 3), which was to be expected, due to the inherent stylization effect of the shallower depth of field. But surprisingly they also appeared to be more credible.

The initial hypothesis that a video image with a large depth of field and lower image quality, leads to a more authentic perception has been disproved (Dux, Loertscher & Iseli, 2019).

The findings indicate that audience experiments are likely to provide surprising new insights regarding the dependence of sensor size and perceived authenticity. Even though the original practice-based hypothesis that perceived realism is likely to be linked to a large depth of field is backed up by theoretical studies on deep focus photography and direct cinema (cf. section 3), the feedback from the quantitative method, based on audience experiments suggests the contrary.

In the focus group's discussion, the experts were rather surprised and certainly challenged by the unexpected outcome. At this point, a final assessment seems too early and further research is needed. Focus group members suggested, however, that the evolution of viewing habits could have an impact on the attribution of realism. Now that consumers of documentary films have been accustomed for more than a decade to the stylized images of large-sensor cameras, a shift in perception could have taken place, in the sense that the new visual quality now seems to correspond more to reality than the aesthetics of a previous era.

In a Swedish study of 2012 that also includes an audience experiment, aspects like depth of field and production value were linked to the viewers' heightened trust in the images they saw. Here, the large depth of field (and the low production value) were persuasive (Eriksson 2012). Even though these findings are in contradiction with the results of the present study, they nevertheless support the line of argument that viewing habits may have changed since the increasing use of large-sensor cameras. This is because the Swedish study was conducted at the beginning of the most recent phase of technological development, at a time in which probably no significant shift

⁵ Minutes of the workshop with broadcast professionals, 12.12.2019.

was yet noticeable, while the current study could now reflect the long term effect of this evolution of viewer expectations.

Our hypothesis about the effect of depth of field on perceived credibility has to be rejected as the direct comparison showed a contrary effect. Although the direct comparison with the forced choice questions is a simplified categorization, it can help to find subtle effects. In the more differentiated questioning after the viewing of the complete films, the viewers didn't indicate a difference in credibility, only in the sharpness and image quality. It is therefore important that the effect is not overinterpreted. Nevertheless, it can be seen as an indication of a change in viewer expectations.

The focus group's discussion also touched on the fact that the cinema setting for the audience experiment could have had an influence on the results. The large screen and the optimal conditions in the dark surroundings for concentrating without distraction may have favored the conscious distinction of the depth of field in the two variants as seventy percent of the audience did perceive a difference at the direct comparison (see figure 3). This finding suggests that the distinguishability is important when it comes to assigning credibility, because the same effect was less obvious in the consecutive sequence of the complete films. It is therefore possible that the viewing of documentary content on smaller screens like television sets, tablets, computers and smartphones, which is more frequent than cinema, could have had a different outcome.



Fig. 3 Results of direct comparison: Sequences of the large sensor camera (1) and of the palmcorder (2) were shown directly after each other.

These preliminary observations are not conclusive and open up promising potential for additional research in this area.⁶

Regarding the use of a mixed methods approach, the research team was challenged far more than in previous projects, in which the comparative aspect had been based on specific recording modes or on postproduction processes. The project *Analog vs. Digital* (2012-15) focused on the transition from analog to digital film production and investigated both the aesthetic change (qualitative approach) as well as the resulting impact on the audience (quantitative approach). Three short feature films were shot with a mirror-rig on which an analog 35mm camera and a digital film camera were mounted (Loertscher et al., 2016). For the filmmakers, there was thus no difference in the way they approached the comparison, because the two variants were produced simultaneously during the recording process. (Iseli & Loertscher, 2017). In the project *Digitized Reality: The Trouble with Motion* (2015-16), a short feature film with a normal frame rate (24 fps) was compared qualitatively and quantitatively with the identical film at two higher frame rates (48 and 96 fps). The shooting was done in 96 fps and the 24 and 48 fps versions were created in post-production (Loertscher M. L., Weibel, D., Mast, F. W., Mennel, P., & Iseli, C., 2020). Here, too, a mixed-method comparison was possible without the film team having to be specially prepared for the comparison (Iseli & Loertscher, 2016; Iseli & Loertscher, 2017).

In the present project *Gadgets, Phones and Drones* it is neither possible to work with mirror-rigs, because this would not take into account the essential characteristics of the cameras and their ergonomics, nor is it possible to create the differences in question in postproduction. In order to compare the effects of the different cameras, the camerapersons followed a master/slave-principle to copy a similar framing of the same content. There could be too many confounding variables for the quantitative analysis without a similar framing. Thus, in this project

the quantitative aspect of the comparison has a direct impact on the actual process of filmmaking (cf. section 6). Thus, in this particular case, use of the applied mixed methods approach counts as a disadvantage. However, this procedure also has clear advantages as the perspective of unbiased viewers (demonstrated by our audience experiments) leads to surprising insights and challenges as described above. In order for the advantages to outweigh the disadvantages, it is important that the practice-based method is expanded by additional research cycles as described in section 6.

Conclusion

The project *Gadgets, Phones and Drones* was designed as a dialogue between different disciplines. Therefore, both the project and the expected output should be measured by the quality of this dialogue. The contribution of practice-based research makes the project unique in that it subjects historical paradigm shifts in the aesthetics of documentary film to a contemporary practice-based analysis. This enables accurate comparisons that allow for new questions in the context of historical change. For instance, one of the main research questions was formulated as to whether the changes could also have an impact on credibility or perceived authenticity; so important for documentary film. In order to be able to answer questions of such scope precisely, a systematic comparative study was needed and thus a dialogue with the quantitative methods of media psychology. A retrospective survey of historical processes would not have provided enough useful data, and a study based solely on artistic research would not have been meaningful enough with regard to questions of perception.

The surprising finding regarding the higher credibility of the large sensor camera demonstrates the challenging quality of the mixed methods approach. In its original assumptions, the research team had not foreseen a tendency towards

6 Minutes of focus group 2, Zurich University of the Arts, 2019.

such a shift in viewing habits. Neither the interviews with peer-experts nor the discussions within the first focus group provided any hints in that direction. Only the mixed methods approach and the inclusion of an unbiased reference group without prior knowledge has been able to clearly challenge the original hypothesis and the predominant views of the filmmaking community.

Aside from demonstrating that positive results can be achieved through the application of this approach, the use of mixed methods proved to be challenging for an artistic research scheme to accommodate. As discussed in detail in section 5, it became evident that the strict requirements of comparability tended to limit the artistic potential of the resulting filmic works. The discussions of the focus groups have strongly reflected this phenomenon and have also led to further iteration cycles and the production of additional film variants with a focus on the artistic expression. These variants serve to take into account the complexity of the artistic work and allow a varied examination of the research questions.

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